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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/553,754	10/18/2005	Makoto Iida	125664	5979

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EXAMINER	
MALEKZADEH, SEYED MASOUD	
ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
01/14/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Advisory Action Before the Filing of an Appeal Brief	**Application No.** 10/553,754	**Applicant(s)** IIDA, MAKOTO	
	Examiner SEYED M MALEKZADEH	**Art Unit** 1791	

--The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

THE REPLY FILED 17 December 2007 FAILS TO PLACE THIS APPLICATION IN CONDITION FOR ALLOWANCE.

1. ☒ The reply was filed after a final rejection, but prior to or on the same day as filing a Notice of Appeal. To avoid abandonment of this application, applicant must timely file one of the following replies: (1) an amendment, affidavit, or other evidence, which places the application in condition for allowance; (2) a Notice of Appeal (with appeal fee) in compliance with 37 CFR 41.31; or (3) a Request for Continued Examination (RCE) in compliance with 37 CFR 1.114. The reply must be filed within one of the following time periods:
   a) ☒ The period for reply expires 3 months from the mailing date of the final rejection.
   b) ☐ The period for reply expires on: (1) the mailing date of this Advisory Action, or (2) the date set forth in the final rejection, whichever is later. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of the final rejection.

   Examiner Note: If box 1 is checked, check either box (a) or (b). ONLY CHECK BOX (b) WHEN THE FIRST REPLY WAS FILED WITHIN TWO MONTHS OF THE FINAL REJECTION. See MPEP 706.07(f).

Extensions of time may be obtained under 37 CFR 1.136(a). The date on which the petition under 37 CFR 1.136(a) and the appropriate extension fee have been filed is the date for purposes of determining the period of extension and the corresponding amount of the fee. The appropriate extension fee under 37 CFR 1.17(a) is calculated from: (1) the expiration date of the shortened statutory period for reply originally set in the final Office action; or (2) as set forth in (b) above, if checked. Any reply received by the Office later than three months after the mailing date of the final rejection, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

NOTICE OF APPEAL

2. ☐ The Notice of Appeal was filed on _____. A brief in compliance with 37 CFR 41.37 must be filed within two months of the date of filing the Notice of Appeal (37 CFR 41.37(a)), or any extension thereof (37 CFR 41.37(e)), to avoid dismissal of the appeal. Since a Notice of Appeal has been filed, any reply must be filed within the time period set forth in 37 CFR 41.37(a).

AMENDMENTS

3. ☐ The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because
   (a) ☐ They raise new issues that would require further consideration and/or search (see NOTE below);
   (b) ☐ They raise the issue of new matter (see NOTE below);
   (c) ☐ They are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal; and/or
   (d) ☐ They present additional claims without canceling a corresponding number of finally rejected claims.

   NOTE: _____. (See 37 CFR 1.116 and 41.33(a)).
4. ☐ The amendments are not in compliance with 37 CFR 1.121. See attached Notice of Non-Compliant Amendment (PTOL-324).
5. ☐ Applicant's reply has overcome the following rejection(s): _____.
6. ☐ Newly proposed or amended claim(s) _____ would be allowable if submitted in a separate, timely filed amendment canceling the non-allowable claim(s).
7. ☒ For purposes of appeal, the proposed amendment(s): a) ☐ will not be entered, or b) ☒ will be entered and an explanation of how the new or amended claims would be rejected is provided below or appended.
   The status of the claim(s) is (or will be) as follows:
   Claim(s) allowed: _____.
   Claim(s) objected to: _____.
   Claim(s) rejected: 10-27.
   Claim(s) withdrawn from consideration: _____.

AFFIDAVIT OR OTHER EVIDENCE

8. ☐ The affidavit or other evidence filed after a final action, but before or on the date of filing a Notice of Appeal will not be entered because applicant failed to provide a showing of good and sufficient reasons why the affidavit or other evidence is necessary and was not earlier presented. See 37 CFR 1.116(e).
9. ☐ The affidavit or other evidence filed after the date of filing a Notice of Appeal, but prior to the date of filing a brief, will not be entered because the affidavit or other evidence failed to overcome all rejections under appeal and/or appellant fails to provide a showing a good and sufficient reasons why it is necessary and was not earlier presented. See 37 CFR 41.33(d)(1).
10. ☐ The affidavit or other evidence is entered. An explanation of the status of the claims after entry is below or attached.

REQUEST FOR RECONSIDERATION/OTHER

11. ☒ The request for reconsideration has been considered but does NOT place the application in condition for allowance because: See attached sheet.
12. ☐ Note the attached Information Disclosure Statement(s). (PTO/SB/08) Paper No(s). _____
13. ☒ Other: See attached sheet.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed on 12/17/2007 have been fully considered but they are not persuasive.

Applicants argue that neither Iida et al. (US 6,334,896) nor Fujikawa et al. (US 5,685,907) teach pulling a seed crystal from a raw material melt, wherein when a pulling rate of pulling a single crystal is defined as V (mm/min), a temperature gradient at a solid-liquid interface is defined as G (K/mm) and a highest temperature at an interface between a crucible and a raw material melt is defined as Tmax (°C), at least, a range of a value of V/G $(mm^2/K.\min)$ including a desired defect region and/or a desired defect-free region is determined according to the $T_{\max}(°C)$, as recited in claim 10.

This is not found persuasive because applicants' attention is drawn to the point that Iida et al. (US 6,334,896) or Fujikawa et al. (US 5,685,907) has not been used alone. Combined teaching of Iida et al. ('896) and Fujikawa et al. ('907) clearly teach a method for producing a single crystal by

Czochralski method with pulling a seed crystal from a raw material melt, wherein when a pulling rate of pulling a single crystal is defined as F (mm/min), a temperature gradient at a solid-liquid interface is defined as G (K/mm) and a highest temperature at an interface between a crucible and a raw material melt is defined as $T_{max}(°C)$, at least, a range of a value of F/G $(mm^2/K.\text{min})$ including a desired defect region and/or a desired defect-free region is determined according to the $T_{max}(°C)$, as recited in claim 10. (See Iida et al. ('896) [lines 64-67, column 2 and lines 1-14, column 3]; and further Fujikawa et al. ('907) [lines 35-42, column 10]). Also Iida et al ('896) teaches a method for producing a silicon single crystal by Czochralski method with pulling a seed crystal from a raw material melt, wherein the pulling rate of a single crystal represented by F (mm/min) and an average temperature gradient along the pulling direction of the single crystal within a temperature range of the silicon melting point to 1400°C is represented by G (°C./mm) which is solid-liquid interface gradient temperature. (See abstract and lines 56-67, column 2 and lines 1-39, column 3; also lines 32-44, column 9) Iida et al ('395) further disclose a low defect silicon single crystal can

be obtained by controlling the value of F/G such that the value falls within the range of 0.112 - 0.142 ($mm^2/°C \bullet \min$). (See lines 38-47, column 6) As recited, Iida et al ('896) clearly suggests the average temperature gradient along the pulling direction changes within a temperature range within silicon melting point (1414°C) to 1400°C and accordingly the temperature controls the value of F/G varies within the range of 0.112-0.142 ($mm^2/°C \bullet \min$) to obtain a low defect silicon single crystal.

Further applicants argue that Iida et al. ('896) and Fujikawa et al. ('907) are not combinable because Iida et al. ('896) teaches silicon single crystal produced by the Czochralski method. However, Fujikawa et al. ('907) teaches producing a compound single crystal by the vertical gradient freeze (VGF) solidifying method.

This is not found persuasive because Fujikawa et al. ('907) clearly teaches preparation of a single crystal various methods have been proposed including Czochralski method and vertical gradient freeze (VGF) method (See lines 30-40, column 1) which both methods require a crucible, a seed, and heater and single crystal is grown by solidification of melted source material which is in contact with the seed crystal (See lines 42-49,

column 1). Therefore, manufacturing method of a single crystal by Czochralski method and vertical gradient freeze (VGF) method have comparable technical functions. Thus, combined teaching of Iida et al. ('896) and Fujikawa et al. ('907) clearly teach all the limitations of claims 10-27.

Also, applicants argue there is no motivation to combine the teachings of the Iida et al ('896) and Fujikawa et al. ('907)

The arguments have been fully considered but are not found to be persuasive, because the examiner recognizes that obviousness can be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992)

Therefore, rejections of claims 10-27 are maintained.

Remarks

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Masoud Malekzadeh whose telephone number is 571-272-6215. The examiner can normally be reached on Monday - Friday at 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra N. Gupta can be reached on (571) 272-1316. The fax number for the organization where this application or proceeding is assigned is 571-272-8300.

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SMM